

Bayesian Framework Based Damage Segmentation (BFDS) with Time-Reversal Tomography (TRT) for Damage Characterization in Complex Aircraft Structures, Phase I

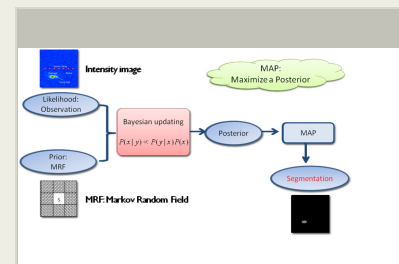
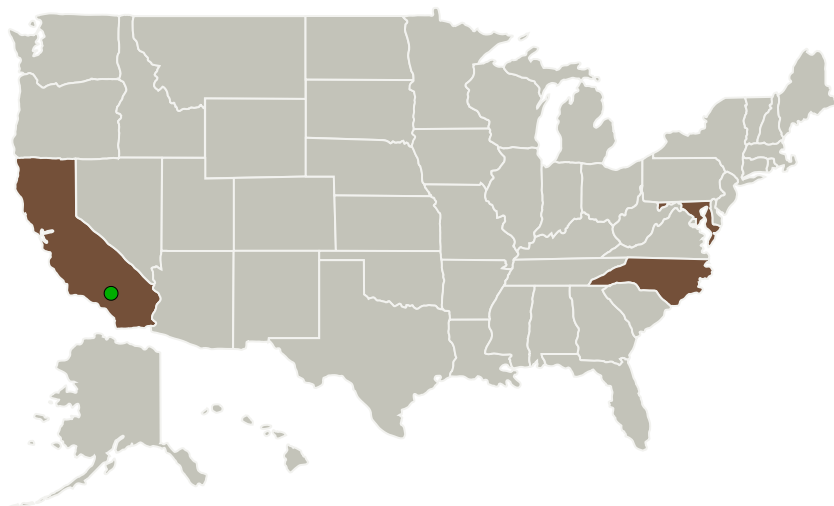
Completed Technology Project (2013 - 2014)



Project Introduction

To meet the NASA's need for innovative technologies that decrease turn-around time for inspections and assessments for safe operations of aircraft and spacecraft, X-wave Innovations, Inc. (XII), teaming up with Prof. Fuh-Gwo Yuan at North Carolina State University (NCSU), proposes to develop an innovative guided-wave based Time-Reversal Tomography (TRT) technology and Bayesian Framework based Damage Segmentation (BFDS) technology for finite-size damage detection and characterization in complex structures. This framework provides a means for evaluation of the Model-Assisted Probability of Detection (MAPOD) and Confidence Level (CL) for damage characterization in the context of Structural Health Monitoring (SHM).

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
X-wave Innovations	Lead Organization	Industry Women-Owned Small Business (WOSB)	Gaithersburg, Maryland
● Armstrong Flight Research Center(AFRC)	Supporting Organization	NASA Center	Edwards, California
North Carolina State University at Raleigh	Supporting Organization	Academia	Raleigh, North Carolina

Primary U.S. Work Locations

California	Maryland
North Carolina	

Project Transitions

▶ **May 2013:** Project Start

✓ **May 2014:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138014>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

X-wave Innovations

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

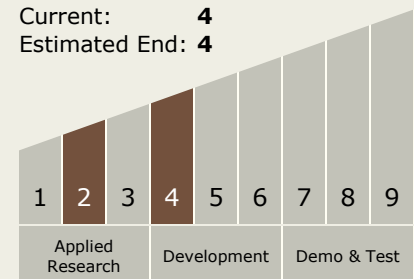
Carlos Torrez

Principal Investigator:

Carlos Rentel

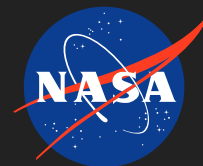
Technology Maturity (TRL)

Start: 2
Current: 4
Estimated End: 4

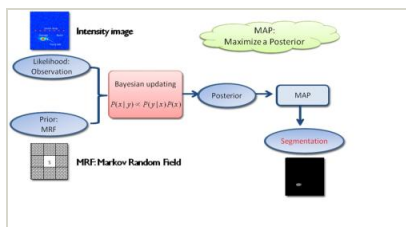


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Images



Project Image

Bayesian Framework based Damage Segmentation (BFDS) with Time-Reversal Tomography (TRT) for Damage Characterization in Complex Aircraft Structures (<https://techport.nasa.gov/image/135248>)

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.2 Structures
 - └ TX12.2.4 Tests, Tools and Methods

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System